

AMBIENT AIR QUALITY IMPACT REPORT
Knauf Insulation GmbH
Permit No: NSR 4-4-4, SAC 03-01

This document serves as the statement of basis as required by 40 CFR Part 124. This document sets forth the legal and factual basis for permit conditions, with references to applicable statutory or regulatory provisions, including provisions under 40 CFR 52.21. This document is for all parties interested in the permit.

I. APPLICANT

Knauf Insulation GmbH
One Knauf Drive
Shelbyville, IN 46176

II. PROJECT LOCATION

Knauf Insulation GmbH is an existing fiberglass manufacturing facility is located at 3100 Ashby Road, Shasta Lake, California 96019.

III. FACILITY DESCRIPTION

The fiberglass manufacturing operations at Knauf Insulation GmbH (Knauf) consist of the following: (1) raw materials handling and mixing; (2) molten glass production; (3) glass fiber forming, curing, and cooling; and (4) fiberglass trimming and packaging.

The raw materials handling and mixing operations consist of storage bins and tanks that are used to store materials which are used to produce the fiberglass insulation. Emissions from this operation consist primarily of particulate matter, which are captured in dust collectors within the facility and are not vented to the outside air. Molten glass production is achieved using an electric glass melting furnace that has a current production capacity of 225 tons of glass pulled per day (tpd). Emissions from the furnace are vented to the Furnace Stack. The forming, curing, and cooling operations make up the manufacturing line where emissions are vented to the Main Stack. Emissions from the fiberglass trimming and packaging operations are also captured in dust collectors which are vented within the facility and not to the outside air.

IV. PROJECT DESCRIPTION

This permit action is an administrative amendment to the Prevention of Significant Deterioration (PSD) permit issued to Knauf for its Shasta Lake facility on March 14, 2000 and amended on May 11, 2006. The administrative changes are to correct typographical errors, clarify the semi-annual reporting requirements, authorize the replacement of two (2) existing thermal oxidizers with one regenerative thermal oxidizer (RTO), and respond to other requested permit changes. Also, the equipment list was updated based on equipment currently used at the facility. The specific changes are as

follows.

Typographical Corrections

Permit condition 3.a. and 42 have been corrected so that these conditions refer to condition 43 in the permit, and not condition 40. Permit condition 58 has been corrected so that the condition applies to the fiberglass forming/curing/cooling operations and not the glass melting furnace.

Equipment Updates

The equipment listed in the permit was updated. The updates include the following: (1) under the 'raw materials handling and mixing' section, the list includes three sand bin dust collectors and two consumer cullet bin dust collectors instead of one of each; (2) for the 'molten glass production' section, one custom system dual chamber dust collector replaced two pulse jet dust collectors; (3) under the 'fiberglass forming/curing/cooling' section, a venturi scrubber for the cooling line replaced a settling chamber/air washer, and permit conditions 42.b. and 48 have also been updated; and (4) for the 'fiberglass trimming and packaging' section, two condensers were added.

Clarification of Reporting Requirements

Permit condition 10 was amended to clarify the semi-annual reporting periods for semi-annual reports. The permit condition states that semi-annual reports are due 30 days after end of each calendar half following the effective date of the permit and that the reporting periods for each calendar half are January 1- June 30 and July 1 - December 31.

Replacement of Thermal Oxidizers

Knauf proposed to install and operate a RTO on the curing oven at its Shasta Lake facility to replace the two (2) existing thermal oxidizers currently being used at the facility's manufacturing line curing ovens. No other production processes will be changed or modified. This project will not cause any increases in air pollution, and there will be no increase in criteria or hazardous air pollutants associated with the operation of the RTO. The RTO will be designed to achieve the same destruction efficiency, of at least 95 percent, as the two thermal oxidizers. The RTO will be used to continue to destroy volatile organic compounds (VOCs) and condensable particulates from the curing operation at the facility.

The RTO will operate at a minimum temperature of 1475°F and have a residence time of at least 0.75, but the exhaust temperature from the control device will be approximately 550°F. The lower exhaust temperature is due to the configuration of the RTO and because the heat generated is reused within the control device to destroy VOCs and condensable particulates. The existing thermal oxidizers operate at a minimum temperature of 1400°F and exhausts at the same temperature.

The RTO will also use less energy. The existing thermal oxidizers utilize two 18 MMBtu/hr burners (rated maximum capacity), a combined total capacity of 36 MMBtu/hr, to maintain the required firebox temperature. The proposed RTO will use one 1.3 MMBtu/hr burner (rated maximum capacity) to maintain the required firebox temperature. The proposed RTO will recover much of the energy used to keep the firebox at the proper temperature. Essentially, this will result in less natural gas combustion to operate the RTO, and, thus, less energy consumption and fewer emissions.

The gas temperature in the Main Stack will be lower since the exhaust temperature from the RTO (approximately 550°F) will be significantly lower than the exhaust temperature from the existing thermal oxidizers. A lower Main Stack temperature may cause the formation of visible water vapor during colder weather due to the high moisture content (close to saturation) of the Main Stack exhaust stream. This situation may also result in the formation of visible water vapor in the stack itself, which may cause the continuous opacity monitor (COM) data to be inaccurate at these times since the COM may improperly consider this water vapor to be opacity. Per EPA Test Method 9, opacity observations must be made at the point of greatest opacity in the portion of the plume where condensed water vapor is not present.¹ See 40 CFR Part 60 Appendix A-4, EPA Test Method 9, Section 2.3. In other words, condensed water vapor is not considered to be opacity.

The scrubber exhaust for the cooling operation is currently combined with the outlet exhaust of the thermal oxidizers at the curing operation, which are then exhausted to the Main Stack. As part of this project, the exhaust for the cooling operation will be routed to the inlet of the wet electrostatic precipitator (WESP) at the forming section. The existing thermal oxidizers will be kept in place temporarily and operated when the RTO is shutdown, malfunctioning or undergoing maintenance. The permit allows Knauf to operate the existing thermal oxidizers when necessary.

Therefore, the specific changes to the permit are as follows: (1) the equipment list was amended to authorize the installation and operation of the RTO on the curing oven; (2) permit condition 42.b. has been amended to authorize the use of the RTO at the curing oven for destruction of VOCs and condensable particulate matter; (3) permit condition 42.c. has been amended to allow the cooling section exhaust to combine with the WESP at the forming section; (4) permit condition 48 has been amended to include monitoring requirements for the RTO; and (5) permit condition 52 has been updated to clarify the initial performance testing for the operation of the RTO.

¹ Many stationary sources discharge visible emissions into the atmosphere; these emissions are usually in the shape of a plume. EPA Test Method 9 involves the determination of plume opacity by qualified observers.

Other Changes

Knauf requested to delete the requirement in permit condition 17 for reporting to EPA use of the emergency gas burners for the furnace. Since the burners are used infrequently (i.e., twice a year) and Knauf is required to keep records whenever the burners are used and the amount of fuel used, EPA believes it is not necessary to contact EPA whenever the burners are used. This specific requirement has been removed from the permit. The emissions resulting from operation of the burners are expected to be very low. The permit requires Knauf report, to EPA, malfunctions and failures that will result in an increase in emissions above the allowable emission limits in the permit.

Knauf requested to delete permit conditions 3.a., 3.b., 29 and 55 because these conditions are already required in the permit-to-operate (PTO) issued by the Shasta County Air Quality Management District (District). These conditions require Knauf to report malfunctions to EPA and to submit performance testing protocols before each performance test. Since the conditions are standard requirements in the PSD permit that are used to ascertain compliance with the allowable emission limits in the permit, EPA will not delete them.

Since this permit action does not authorize any changes to the glass furnace, permit condition 26 was amended to clarify that the initial performance test for the glass furnace (Furnace Stack) applied 180 days from the date of the effective date of the PSD permit amendment that was issued on May 11, 2006. The effective date of that permit amendment was November 14, 2006. (See 72 Federal Register 544, Jan. 5, 2007.)

V. EMISSIONS FROM THE PROJECT

This permit action does not authorize any emission increases.

VI. APPLICABILITY OF PREVENTION OF SIGNIFICANT DETERIORATION

The PSD regulations (40 CFR 52.21) define a “major stationary source” as any stationary source belonging to a list of 28 source categories which emits or has the “potential to emit” 100 tons per year (tpy) or more of any attainment or unclassified pollutant regulated under the Clean Air Act, or any other source type which emits or has the potential to emit such pollutants in amounts equal or greater than 250 tpy. Knauf is an existing glass fiber processing plant, which included in the list of 28 source categories. Thus, the 100 tpy threshold applies to Knauf. The facility has the potential to emit over 100 tpy of pollutants regulated under the Clean Air Act and has a PSD permit which was issued on March 14, 2000 and amended on May 11, 2006. This permit action does not authorize any modifications or emission increases and, thus, does not trigger major PSD review.

VII. BEST AVAILABLE CONTROL TECHNOLOGY

PSD regulations require that a Best Available Control Technology (BACT) determination be made for each pollutant subject to major PSD review. As noted in Section V, this permit action does not trigger a major PSD review. Therefore, the application of BACT is not required.

VIII. AIR QUALITY IMPACTS

As noted in Section V of this review, this permit action will not result in a major PSD modification. Therefore, an Air Quality Impact Analysis is not required.

IX. ADDITIONAL IMPACT ANALYSIS

As noted in Section V of this review, this permit action will not result in a major PSD modification. Therefore, no additional Impact Analysis is required.

X. ENDANGERED SPECIES ACT

Pursuant to Section 7 of the Endangered Species Act (ESA), 16 U.S.C. §1536, and its implementing regulations at 50 C.F.R. Part 402, EPA is required to ensure that any action authorized, funded, or carried out by EPA is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of such species' designated critical habitat. EPA determined that this PSD permitting action is subject to ESA Section 7 requirements.

Since this permit action will not result in any new construction outside the current footprint of the facility, and does not authorize any emission increases, EPA concludes that the permit action will have no effect on any endangered or threatened species or designated critical habitat.

XI. CONCLUSION AND ACTION

Based on the information supplied by the Applicant, and the analyses conducted by EPA, EPA is issuing the administrative amendment to the PSD permit.